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Peter D Hood

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EXAMINER

WANG, EUGENIA

ART UNIT

PAPER NUMBER

1726

NOTIFICATION DATE

DELIVERY MODE

10/20/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No. 10/520,579	Applicant(s) HOOD ET AL.	
	Examiner EUGENIA WANG	Art Unit 1726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2010 and 17 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 20-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 20-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>8/31/10</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the amendment received July 12, 2010 and the supplemental response received August 17, 2010:

- a. Claims 27-29 have been canceled as per Applicant's request. Claims 1-8 and 20-26 are rejected. (It is noted that the restriction requirement is removed from claims 20-26 in light of the amendments to the claims – the fact that the differences in the distribution foil have been removed and that the cover foil has been amended in a similar manner such that unity is not lacking. Accordingly, the restriction requirement has been withdrawn at this point. Accordingly, any arguments with respect to the restriction requirement are moot.
- b. The 112 rejection has been withdrawn in light of the amendment.
- c. The same prior art has been applied (to the previously rejected claims). However slight changes in interpretation/application have been in light of the amendment. A slightly different rejection is applied to the rejoined claims. All changes to the rejection are made are in light of the amendment. Thus the action is final.

Information Disclosure Statement

2. The information disclosure statement filed August 31, 2010 has been placed in the application file and the information referred to therein has been considered as to the merits, with the exception of the non-English language document.

Specification

3. The disclosure is objected to because of the following informalities: It does not provide support for claim 24. (It is noted that claim 24 is not seen to be new matter, as it is substantially the same as claim 13, as originally presented). However, nothing in disclosure as originally filed has the appreciation of a series of fluid flow field plates acting as cathodes and/or anodes, each fluid flow field plate having a respective membrane-electrode assembly adjacent thereto. It is noted that The membrane-electrode assembly itself includes the electrodes, and thus the claim language suggests that there are two anodes and two cathodes for a fuel cell, which is not the case. (See p 1, lines 8-30, which defines the cathode and anode separately from the flow plates.)

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 24-25 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 24 appears to be require a doubling of one of the electrodes (as the fluid flow field plates act as cathodes/anodes and they are adjacent to a membrane-electrode assembly, wherein membrane-electrode assembly requires the electrodes as well.) Accordingly, it is unsure what structure is being claimed (a structure with two electrodes or wherein the flow field plate brings a reactant

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for oxidation or reduction and thus constitutes the anode or cathode). Since claim 25 is dependent on claim 24 and fails to clarify this issue, it is rejected for the same reason.

b. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term “anode/cathode” in claim 1 is used by the claim to mean “flow filed plates”, while the accepted meaning is “electrode.” The term is indefinite because the specification does not clearly redefine the term. Since claim 25 is dependent on claim 24 and fails to clarify this issue, it is rejected for the same reason.

c. Claim 25 requires “an adjacent membrane-electrode assembly” (line 3). However such a structure has already been given antecedent basis in claim 24, which claim 25 is dependent from. Thus such a term is over-defined and thus indefinite (as it is unclear as to whether or not the same membrane-electrode assembly or a different one is being referred to).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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5. Claims 1, 2, 6-8, and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6066408 (Vitale et al.) in view of US 6303245 (Nelson) and US 5998054 (Jones et al.).

As to claim 1, Vitale et al. teach of a fuel cell assembly (fig. 1; col. 1, lines 8-12). There is a fluid flow plate (for example cathode plate [216]) with a channels (for example flow channel [210], which constitutes channels as a plurality of grooves are seen in the cross sectional view, as in fig. 1, along with any of the through holes through the plate), which forms the pattern seen in the plate, barring specification as to what constitutes a channel and the relationship of such channel. (See also, the 112 section for the interpretation taken with respect fact that a serpentine path constitutes channels.) Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).

Furthermore, there is a distribution foil (cooler-humidifier plate [202]) wherein with a plurality of channels (fig. 3). (It is noted that the lands [304] and island lands [306] are taken to from a plurality of channels within channel [218]. Additionally, it is noted that although not depicted, that one embodiment includes a plurality of channels (col. 7, lines 59-63). The embodied material for the cooler-humidifier plate [202] is stainless steel (thus qualifying it to be considered a foil) (col. 6; lines 33-35).

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It is noted that the cathode plate [216] is seen to be a cover extending over the distribution foil (humidifier plate [202]) to enclose the channels and form conduits for water injection between the them, as Vitale et al. teach that plate [216] serves the purpose of closing open-face flow channels [218] of the cooler-humidifier plate [202], wherein the wick of the coolant-humidifier plate [202] provides water to the reactant gas (col. 6, lines 44-46; col. 7, lines 64-65; fig. 3). It is noted that outlet [226] bridges the termination of the channels (end portion of channel [218]) as well as provides direct fluid communication with a respective field plate channel (as it provides cathode gas water via manifold [256]) (fig. 2C; col. 7, lines 20-31). This constitutes a water injection point that enables delivery of water directly into corresponding field plate channel.

Vitale et al. does not specifically teach (a) that the cover (cathode plate [216]) is a foil (the material used for the anode/cathode plates) or (b) that water injection points (plural) exist to inject water at different positions in the field plate.

With respect to (a), Nelson teaches that anode and cathode plates are typically metal (thus qualifying such plates to be a foil) (col. 1, lines 45-47). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a metal material (foil) for the cathode plate of Vitale et al. since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

With respect to (b), Jones et al. teach a fluid flow plate (bipolar plate), wherein a big composite inlet [126] is broken up into smaller inlets within (and wherein composite

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flow channel (serpentine flow pattern) is broken up with flow smaller flow channels within), wherein each of the smaller each of the smaller inlets/flow channels (which make up one big composite channel) has an equal number of points for water injection [131] (fig. 2; fig. 3). The motivation for employing such a system (multiple smaller flow channels/inlet within one composite flow channel/inlet and a corresponding number of injection ports for water inlet for each smaller flow channel within the composite flow channel) is that such a system would allow easier mixing and uniform distribution of water over the volume of the fuel cell assembly (col. 3, lines 5-13; 26-34). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to inject water at a plurality of points as a composite inlet for the composite channel (for application of humidity to each) (as taught by Jones et al. and applied to Vitale et al.), in order to have a fuel cell system wherein the water introduced to the reactant flow can be more uniformly mixed and distributed through the cell.

As to claim 2, Vitale et al.'s inlet portion (i.e. gas inlet [314], water inlet [210], and portions of channel [218] close to the inlet) constitute a first series of channels extending to a first edge of the foil. Channel [218] with the lands [304] and island lands [306] constitute an array of channels in communication with the first series of channels, forming a pressure distribution gallery, as such a depicted channel keeps pressure differential low (col. 8, lines 44-49). Vitale et al.'s outlet portion (outlet [226] and portion of channel [218] close to the outlet) constitute a second series of channels extending to a second edge of the foil (fig. 2C; fig. 3). (It is noted that as these series of channels are near the different peripheral portions, they are interpreted to extend to the edges, as

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they are seen to be part of the edge portion (as they are close to the peripheral border of the plate), barring specification as what constitutes “extending to... a... edge.” Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).) Additionally, it is noted that Jones et al. has also been relied upon to teach that each fluid flow plate (bipolar plate) has a plurality of inlets/flow channels (as part of a composite inlet/channel) and an equal amount of channels for water injection [131] (fig. 2; fig. 3) (as set forth in the rejection to claim 1). Accordingly, at the very least, the combination would render obvious such claimed plurality of channels (as applied to the second series).

As to claim 3, Vitale et al.’s fig. 2C, outlet [226] can be seen to be a convergence structure, as it focuses water flow into the channels [210] in the fluid flow plate of fluid flow (as humid air exits through outlet [226]) (col. 7, lines 26-30).

It is noted that although Vitale et al. do not teach a plurality of convergence structures (corresponding with corresponding smaller field plate channels, part of one composite channel), Vitale et al. has been combined with Jones et al., wherein Jones et al. provides such a teaching. The teaching and reasoning for obviousness are reiterated herein for clarity’s sake: Jones et al. teach a fluid flow plate (bipolar plate), wherein a big composite inlet [126] is broken up into smaller inlets within (and wherein composite flow channel (serpentine flow pattern) is broken up with flow smaller flow

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channels within), wherein each of the smaller each of the smaller inlets/flow channels (which make up one big composite channel) has an equal number of points for water injection [131] (fig. 2; fig. 3). The motivation for employing such a system (multiple smaller flow channels/inlet within one composite flow channel/inlet and a corresponding number of injection ports for water inlet for each smaller flow channel within the composite flow channel) is that such a system would allow easier mixing and uniform distribution of water over the volume of the fuel cell assembly (col. 3, lines 5-13; 26-34). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to inject water at a plurality of points as a composite inlet for the composite channel (for application of humidity to each) (as taught by Jones et al. and applied to Vitale et al.), in order to have a fuel cell system wherein the water introduced to the reactant flow can be more uniformly mixed and distributed through the cell. (It is noted that any plural injection points can be considered a convergence structure, as applied to the teaching of Vitale et al.)

As to claim 4, Vitale et al.'s convergence structure (gas outlet [226]) shows a recess on the second edge of the distribution foil (plate [202]), as gas outlet [226] is cut out (fig. 3).

As to claim 5, Vitale et al.'s cut out (gas outlet [226]) can be considered to be arcuate, as at least one portion of the cut out is curved.

As to claim 6, Vitale et al. has the structure wherein there is a termination point at the first edge (inlet portion of plate [202], as seen in fig.3). Furthermore one outlet [226] (also a termination point) feeds into the cathode supply inlet [258] (fig. 2c). Although,

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outlet [226] feeds into cathode supply inlet [258] at the second edge, it is seen that the claim language is met (as the channels terminate at the first edge as well as at one supply manifold aperture) barring specification of the relationship between the first edge and supply manifold aperture. Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).

As to claim 7, Vitale et al. embody using stainless steel for the cooler-humidifier plate [202] is stainless steel (col. 6; lines 33-35).

As to claim 8, although Vitale et al. does not teach the method of which the distribution foil channels [218] are made, such a limitation is seen to be a product-by-process limitation, wherein the structure of Vitale et al. is the same as the claimed invention.

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

“The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature” than

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when a product is claimed in the conventional fashion. *In re Fessmann*, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

As to claim 20, Vitale et al. teach of a fuel cell assembly (fig. 1; col. 1, lines 8-12). There is a fluid flow plate (for example cathode plate [216]) with a channels (for example flow channel [210], which constitutes channels as a plurality of grooves are seen in the cross sectional view, as in fig. 1, along with any of the through holes through the plate), which forms the pattern seen in the plate, barring specification as to what constitutes a channel and the relationship of such channel. (See also, the 112 section for the interpretation taken with respect fact that a serpentine path constitutes channels.) Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).

Furthermore, there is a distribution foil (cooler-humidifier plate [202]) wherein with a plurality of channels (fig. 3). (It is noted that the lands [304] and island lands [306] are

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taken to from a plurality of channels within channel [218]. Additionally, it is noted that although not depicted, that one embodiment includes a plurality of channels (col. 7, lines 59-63). The embodied material for the cooler-humidifier plate [202] is stainless steel (thus qualifying it to be considered a foil) (col. 6; lines 33-35).

It is noted that conductive sealing gasket [205] is seen to be a cover co-extensive with a substantial part of the distribution foil (humidifier plate [202]) to enclose the channels and form conduits for water injection between the them, as Vitale et al. teach that gasket [205] along with plate [216] serves the purpose of closing open-face flow channels [218] of the cooler-humidifier plate [202], wherein the wick of the coolant-humidifier plate [202] provides water to the reactant gas (col. 6, lines 44-46; col. 7, lines 64-65; figs. 2a, 2b, 2c). It is noted that outlet [226] bridges the termination of the channels (end portion of channel [218]) as well as provides direct fluid communication with a respective field plate channel (as it provides cathode gas water via manifold [256]) (fig. 2C; col. 7, lines 20-31). This constitutes a water injection point that enables delivery of water directly into corresponding field plate channel.

It is first noted that .the embodied material for the cooler-humidifier plate [202] is stainless steel (thus qualifying it to be considered a foil) (col. 6; lines 33-35). However, Vitale et al. does not specifically teach (a) that the cover (gasket [205]) is a foil (the material used) or (b) that water injection points (plural) exist to inject water at different positions in the field plate.

With respect to (a), Nelson teaches that that metal materials are known electrically conductive materials to contain flow within a fuel cell assembly (col. 1, lines

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45-47). Although applied to the anode/cathode plates, it shows the general teaching of known electrically conductive materials to hold fluids in a fuel cell environment. Accordingly, the use of such materials for the gasket [205] of Vitale et al. would have provided the predictable result of operating as an electrically conductive element to hold fluid within a fuel cell. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use a foil material (metal) as the gasket [205] of Vitale et al., as doing so would have provided the predictable result of operating as an electrically conductive element to hold fluid within a fuel cell. "When considering obviousness of a combination of known elements, the operative question is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at ___, 82 USPQ2d at 1396." See MPEP §2141(I).

With respect to (b), Jones et al. teach a fluid flow plate (bipolar plate), wherein a big composite inlet [126] is broken up into smaller inlets within (and wherein composite flow channel (serpentine flow pattern) is broken up with flow smaller flow channels within), wherein each of the smaller each of the smaller inlets/flow channels (which make up one big composite channel) has an equal number of points for water injection [131] (fig. 2; fig. 3). The motivation for employing such a system (multiple smaller flow channels/inlet within one composite flow channel/inlet and a corresponding number of injection ports for water inlet for each smaller flow channel within the composite flow channel) is that such a system would allow easier mixing and uniform distribution of water over the volume of the fuel cell assembly (col. 3, lines 5-13; 26-34). Therefore it

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would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to inject water at a plurality of points as a composite inlet for the composite channel (for application of humidity to each) (as taught by Jones et al. and applied to Vitale et al.), in order to have a fuel cell system wherein the water introduced to the reactant flow can be more uniformly mixed and distributed through the cell.

As to claim 21, Vitale et al.'s inlet portion (i.e. gas inlet [314], water inlet [210], and portions of channel [218] close to the inlet) constitute a first series of channels extending to/proximal to a first edge of the foil. Channel [218] with the lands [304] and island lands [306] constitute an array of channels in communication with the first series of channels, forming a pressure distribution gallery, as such a depicted channel keeps pressure differential low (col. 8, lines 44-49). Vitale et al.'s outlet portion (outlet [226] and portion of channel [218] close to the outlet) constitute a second series of channels extending to/proximal to a second edge of the foil (fig. 2C; fig. 3). (It is noted that as these series of channels are at the very least near the different edges, they are seen to be part of the edge portion, barring specification as what constitutes "extending to...positions proximal to, or at, a... edge." Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).) Additionally, it is noted that Jones et al. has also been relied upon to teach that each fluid flow plate (bipolar plate) has a plurality of inlets/flow channels (as part of a

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composite inlet/channel) and an equal amount of channels for water injection [131] (fig. 2; fig. 3) (as set forth in the rejection to claim 1). Accordingly, at the very least, the combination would render obvious such claimed plurality of channels (as applied to the second series).

As to claim 22, Vitale et al.'s fig. 2C, outlet [226] can be seen to be a convergence structure, as it focuses water flow into the channels [210] in the fluid flow plate of fluid flow (as humid air exits through outlet [226]) (col. 7, lines 26-30).

As to claim 23, Vitale et al. has the structure of distribution channels, wherein one outlet [226] feeds into the cathode supply inlet [258] (taken to be at a first position in light of the fact that such first position is not defined).

As to claim 24, Vitale et al. teach a typical fuel cell has an electrolyte membrane [106], a cathode area [108] and an anode area [102], wherein platinum is used on both the anode side and the cathode side (constituting a membrane electrode assembly) and wherein flow fields sandwich and direct reactant each side (and thus constitute cathode and anode) (fig. 1; col. 1, lines 44-58; col. 2, lines 1-19). It is noted that although one fuel cell is shown in their specified cooler-humidifier plate, a stack is embodied (abs; fig. 2-3). Accordingly, there are membrane-electrode assemblies adjacent to two sides of the flow field plate (cathode plate [216]). (As seen in fig. 2A there would be an electrolyte membrane [221] would be to the left, as seen, and one to the right, not seen, but constituting a stack structure.)

As to claim 25, Vitale et al. has flow field plate [216] with a distribution foil (humidifier [202]) and cover foil (gasket [205]) stacked to the right (fig. 2A). Accordingly,

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the distribution foil and cover foil is between the flow field plate and membrane assembly (to the right of the stack, not seen in fig. 2A but necessary for the stack embodied) (abs; fig. 1a).

As to claim 26, Vitale et al. teach of a fuel cell assembly (fig. 1; col. 1, lines 8-12). There is a fluid flow plate (for example cathode plate [216]) with a channels (for example flow channel [210], which constitutes channels as a plurality of grooves are seen in the cross sectional view, as in fig. 1, along with any of the through holes through the plate), which forms the pattern seen in the plate, barring specification as to what constitutes a channel and the relationship of such channel. (See also, the 112 section for the interpretation taken with respect fact that a serpentine path constitutes channels.) Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Zletz*, 893F.2d 319, 321-22, 13 USPQ2d, 1320, 1322 (Fed. Cir. 1989).

Furthermore, Vitale et al. teach that a typical fuel cell, has an electrolyte membrane [106], a cathode area [108] and an anode area [102], wherein platinum is used on both the anode side and the cathode side (constituting a membrane electrode assembly, MEA) and wherein flow fields sandwich and direct reactant each side (fig. 1; col. 1, lines 44-58; col. 2, lines 1-19). It is noted that although one fuel cell is shown in their specified cooler-humidifier plate, a stack is embodied (abs; fig. 2-3). Accordingly, there are membrane-electrode assemblies adjacent to two sides of the flow field plate

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(cathode plate [216]). (As seen in fig. 2A there would be an electrolyte membrane [221] would be to the left, as seen, and one to the right, not seen, but constituting a stack structure.) It is noted that the adjacency would extend across the active area of the MEA, as it extends to the same area (as seen in fig. 2A).

Furthermore, there is a distribution foil (cooler-humidifier plate [202]) wherein with a plurality of channels (fig. 3). (It is noted that the lands [304] and island lands [306] are taken to from a plurality of channels within channel [218]. Additionally, it is noted that although not depicted, that one embodiment includes a plurality of channels (col. 7, lines 59-63). The embodied material for the cooler-humidifier plate [202] is stainless steel (thus qualifying it to be considered a foil) (col. 6; lines 33-35).

It is noted that conductive sealing gasket [205] is seen to cover the distribution foil (humidifier plate [202]) to enclose the channels and form conduits for water injection between the them, as Vitale et al. teach that gasket [205] along with plate [216] serves the purpose of closing open-face flow channels [218] of the cooler-humidifier plate [202], wherein the wick of the coolant-humidifier plate [202] provides water to the reactant gas (col. 6, lines 44-46; col. 7, lines 64-65; figs. 2a, 2b, 2c). It is noted that outlet [226] bridges the termination of the channels (end portion of channel [218]) as well as provides direct fluid communication with a respective field plate channel (as it provides cathode gas water via manifold [256]) (fig. 2C; col. 7, lines 20-31). This constitutes a water injection point that enables delivery of water directly into corresponding field plate channel.

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It is first noted that the embodied material for the cooler-humidifier plate [202] is stainless steel (thus qualifying it to be considered a foil) (col. 6; lines 33-35). However, Vitale et al. does not specifically teach (a) that the cover (gasket [205]) is a foil (the material used) or (b) that water injection points (plural) exist to inject water at different positions in the field plate.

With respect to (a), Nelson teaches that metal materials are known electrically conductive materials to contain flow within a fuel cell assembly (col. 1, lines 45-47). Although applied to the anode/cathode plates, it shows the general teaching of known electrically conductive materials to hold fluids in a fuel cell environment. Accordingly, the use of such materials for the gasket [205] of Vitale et al. would have provided the predictable result of operating as an electrically conductive element to hold fluid within a fuel cell. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use a foil material (metal) as the gasket [205] of Vitale et al., as doing so would have provided the predictable result of operating as an electrically conductive element to hold fluid within a fuel cell. "When considering obviousness of a combination of known elements, the operative question is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at ___, 82 USPQ2d at 1396." See MPEP §2141(I).

With respect to (b), Jones et al. teach a fluid flow plate (bipolar plate), wherein a big composite inlet [126] is broken up into smaller inlets within (and wherein composite flow channel (serpentine flow pattern) is broken up with flow smaller flow channels

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within), wherein each of the smaller each of the smaller inlets/flow channels (which make up one big composite channel) has an equal number of points for water injection [131] (fig. 2; fig. 3). The motivation for employing such a system (multiple smaller flow channels/inlet within one composite flow channel/inlet and a corresponding number of injection ports for water inlet for each smaller flow channel within the composite flow channel) is that such a system would allow easier mixing and uniform distribution of water over the volume of the fuel cell assembly (col. 3, lines 5-13; 26-34). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to inject water at a plurality of points as a composite inlet for the composite channel (for application of humidity to each) (as taught by Jones et al. and applied to Vitale et al.), in order to have a fuel cell system wherein the water introduced to the reactant flow can be more uniformly mixed and distributed through the cell.

Response to Arguments

6. Applicant's arguments filed July 12, 2010 have been fully considered but they are not persuasive.

.With respect to claims 1, 20, and 26, Applicant argues that the amended claims are not rendered obvious, specifically the fact that the water injection conduits are configured to inject water at different positions in the field plate channel, wherein Applicant points out that there is one injection port [131] for each inlet.

Examiner respectfully disagrees. It is submitted that the interpretation taken with respect to Jones et al. is that the multiple channels shown make up one large composite channel (wherein Vitale et al. has one composite channel shown), wherein the

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combination of the teaching of Jones et al. renders obvious imparting such a breakdown of one large composite channel into a having a plurality of inlets (and thus water injection points). As the composite channel has a plurality of inlets each inlet portion [126] (as seen in fig. 3) constitutes an inlet at a different place of the composite channel (portion leaving the inlet). Nothing in the claim language precludes such an interpretation (that a composite channel made up of channels within) can be formed) (as all channels can be interpreted to be one and integral, as they have the same inlet and outlet point). Accordingly, such arguments are not found to be persuasive, and the rejection of record is maintained.

Applicant argues that the dependent claims are distinct from the prior art of record for the same reason as the independent claim.

Examiner respectfully disagrees. The rejection with respect to the independent claim has been maintained, and thus the rejections to the dependent claims are maintained as well.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on a flex schedule, generally 6 - 3:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./
Examiner, Art Unit 1726

/Gregg Cantelmo/
Primary Examiner, Art Unit 1726